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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

CHAMBLISS, A

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 07/30/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/784,965

Applicant(s)

FJELSTAD, JOSEPH

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 1-20 in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 21-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected claims, there being no allowable generic or linking claim.

Information Disclosure Statement

2. The information disclosure statement submitted on 2/16/01 was filed before the mailing date of the non-final rejection on 7/26/01. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the petition is granted and the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters " 155' " and " 150' " have both been used to designate top surface in Fig. 3. Correction is required.

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Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " MICROELECTRONIC ASSEMBLIES HAVING EXPOSED CONDUCTIVE TERMINALS ".

Claim Objections

5. Claim 3 is objected to because of the following informalities: " top surface of said dielectric material " needs to be changed to -- bottom surface of said dielectric material -
-. Appropriate correction is required.

6. Claim 18 is objected to because of the following informalities: the dependency of this claim needs to be changed from " 17 " to -- 14 --. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 1-4, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Melton et al. (U.S. 5,844,315).

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With respect to Claim 1, Melton teaches a microelectronic element 12 having a front face including contacts 36 with a back surface remote there from and edges extending there between. The mass of dielectric material 14 at least partially encapsulates the microelectronic element 12. The conductive units 16, 19, 20 embedded in the mass of dielectric material 14 along at least one microelectronic element edge. One conductive unit consists of a combination of 16, 19, and 20. Some of the conductive units 16, 19, 20 being exposed on oppositely facing exterior surfaces of the mass of dielectric material 14. The conductive elements 18 extend through the dielectric material 14 and electrically interconnect the contacts 36 with the conductive units 16, 19, 20 (see Fig. 6).

With respect to claim 2, the dielectric material 14 has a top exterior surface juxtaposed with the front face of the microelectronic element 12 and a bottom exterior surface juxtaposed with the back surface of the microelectronic element 12. some of the conductive units 16, 19, 20 are exposed at both the top and bottom exterior surfaces of the dielectric material 14 (see Fig. 6).

With respect to Claim 3, the conductive units 16, 19, 20 include a pad portions 16, 19 exposed at the bottom surface of the dielectric material 14 and a protrusion 20 extending from the pad portion 19 exposed at bottom of the surface of the dielectric material 14. The cross sectional area of each of the protrusion 20 is smaller than the cross sectional area of the pad portion associated with the protrusion 20 (see Fig. 6).

With respect to Claim 4, the protrusions 20 extend from a portion of the associated pad portion 16, 19 furthest from the microelectronic element 12 (see Fig. 6).

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With respect to Claim 7, the conductive units 16, 19, 20 protrude from the top exterior surface (see Fig. 6).

With respect to Claim 8, the back surface of the microelectronic element 12 is exposed at an exterior surface of the assembly (see Fig. 6).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5, 6, 10-12, 14, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melton et al. (U.S. 5,844,315) as applied to claims 1, 2 and 8 above, and further in view of Kitano et al. (U.S. 5,608,265).

With respect to Claim 5, to form a second microelectronic assembly instead of just one would readily be recognized to one skilled in the art, since in the absent of new and unexpected results the duplication of parts is obvious. The court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). Therefore, the assemblies would be juxtaposed with each other such that exposed conductive units at bottom exterior surface of the first assembly are electrically connected to the exposed conductive units at the top exterior surface of the second assembly.

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With respect to Claim 6, Melton discloses a substrate 40 would be underlying the bottom exterior surface of the second assembly, wherein the exposed conductive units of the second assembly are connected to the substrate 40.

Melton fails to disclose a thermally conductive adhesive attached to the back surface of the microelectronic element. Conductive units having hollow centers, wherein the hollow centers extend through the conductive units. A reflowable conductive material exposed at one of the exterior surfaces of the assembly. However, with respect to Claim 9, a thermally conductive adhesive 15 is attached to back surface of the microelectronic device by chip pad 2 (see Fig. 11).

With respect to Claims 10 and 11, Kitano discloses some of the conductive units 4-1, 4-2, 4-3 having hollow centers 7, wherein the hollow centers extend through the conductive units 4-1, 4-2, 4-3 (see Figs. 2-5). Therefore, it would have been obvious to use the hollow conductive units as taught by Kitano with the semiconductor assembly taught by Melton to improve the electrical connection between plural assemblies.

With respect to Claims 12 and 13, Kitano discloses a reflowable conductive material 5 is exposed at one of the exterior surfaces of the assembly (see Figs. 2-5).

With respect to Claims 14 and 18, Kitano discloses a first microelectronic element 1 in 14-d has a front face including contacts and a back surface remote there from. A second microelectronic element 1 in 14-c is juxtaposed with the front face of the first microelectronic element 1 and having terminals thereon. A mass of dielectric material 6 at least partially encapsulating the first microelectronic element 1 and fully encapsulating the second microelectronic element 1. The conductive units 5 secured to

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the mass of dielectric material 6. The conductive elements 3 extend through the dielectric material 6 and electrically interconnect the contacts and the terminals with the conductive units 5 with each other, wherein one or more of the conductive units 5 are exposed at an exterior surface of the assembly (see Figs. 2-5 and 10).

11. Claims 14-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kitano et al. (U.S. 5,608,265).

With respect to Claims 14 and 18, a first microelectronic element 1 in 14-d has a front face including contacts and a back surface remote there from. A second microelectronic element 1 in 14-c is juxtaposed with the front face of the first microelectronic element 1 and having terminals thereon. A mass of dielectric material 6 at least partially encapsulating the first microelectronic element 1 and fully encapsulating the second microelectronic element 1. The conductive units 5 secured to the mass of dielectric material 6. The conductive elements 3 extend through the dielectric material 6 and electrically interconnect the contacts and the terminals with the conductive units 5 with each other, wherein one or more of the conductive units 5 are exposed at an exterior surface of the assembly (see Figs. 2-5 and 10).

With respect to Claims 15-17, the second microelectronic element 1 includes a face surface having terminals and a back surface remote there from, wherein the back surface faces and is attached to the front surface of the first microelectronic element 1 by the conductive units 5 (see Fig. 10).

With respect to Claim 19, a thermally conductive adhesive 15 is attached to the back surface of the first microelectronic element 1 by the chip pad 2 (see Fig. 11).


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Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. It is cited primarily to show the product of the instant invention.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.


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AC/July 26, 2001